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The Construction and Testing of HTS coils for 10T Solenoid

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Abstract: Double pancake coils are being fabricated using second generation (2G) High Temperature Superconductor (HTS) manufactured by SuperPower for a prototype 10T solenoid. This is a part of a SBIR (Small Business Innovative Research) award to Particle Beam Lasers, Inc. (PBL) with Brookhaven National Laboratory (BNL) being a research partner to build and test the solenoid. Each half pancake is made from two lengths of tape, so that the total length of conductor in each coil is 100m. The inner diameter of the coil is ~100mm and the outer diameter, 162mm. For inter-turn insulation, a 0.0254mm thick stainless steel tape was co-wound with the conductor. During the testing of the coils at cryogenic temperatures, the voltage developed across each coil was measured as a function of current at temperatures between ~77K and ~4.2K. Irreversible degradation of the coil performance due to thermal shock was observed. The defects could be located by measuring the voltage

distribution in the coil. The detailed results and the improvements required in order to achieve the goal of 10T will be discussed.

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Acknowledgement (Complete):
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Category (Complete): L1.11 HTS-base Magnets
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Visa Request: None (Default)

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